

# Storm Fury on the Plains

Spring Spotter Newsletter

April 2014

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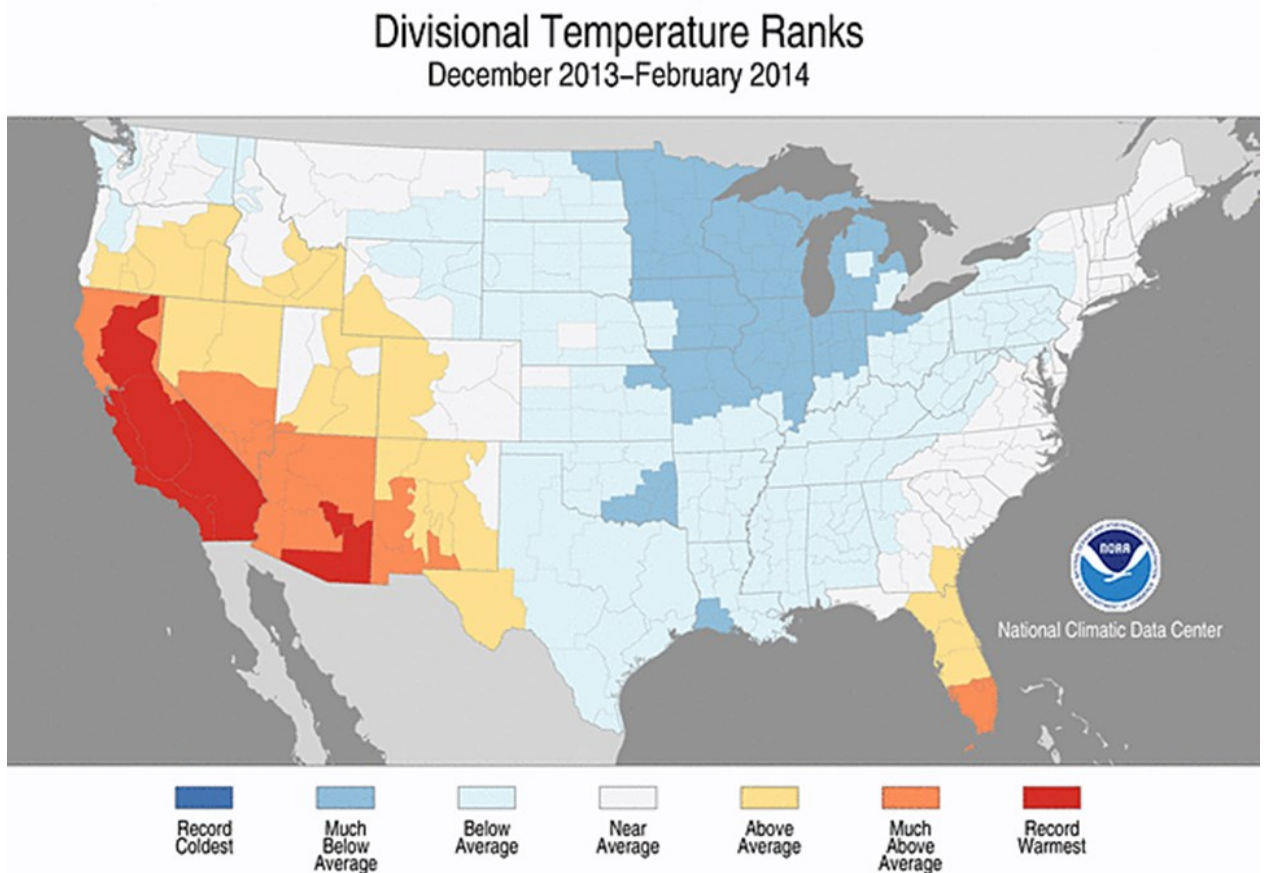
## Winter 2013-14: Cold and Dry

*By: Andy Kleinsasser - Meteorologist*

Much of the region, and in fact much of the central part of the country, faced a rather chilly and dry winter this past year. The culprit was an area of low pressure in the mid-levels of the atmosphere infamously known as the “polar vortex.” The polar vortex is a normal winter phenomena, typically remaining across Canada. However, this past winter the polar vortex on numerous occasions dipped further south than normal allowing bitter cold air to invade the lower 48 states, sometimes for extended periods of time. Some of the coldest parts of the nation were the Upper Mississippi River Valley and Midwest with many of those locations experiencing their coldest winter since the late 1970s and ranking in the top-10 coldest winters on record. For Kansas, it was the coldest winter since 2010 and the 23<sup>rd</sup> coldest on record. Generally, eastern portions of the Sunflower State registered colder temperatures than the west. The only warm parts of the

Kansas Winter 2013-14 (December—February)				
	<u>Wichita</u>	<u>Topeka</u>	<u>Goodland</u>	<u>Dodge City</u>
Average Temp( °F)	31.0 (-3.4)	27.8 (-4.2)	28.3 (-2.3)	29.9 (-3.7)
Precipitation (Inches)	1.59 (-1.62)	2.22 (-1.31)	0.99 (-0.34)	1.32 (-0.78)
Snowfall Nov-Mar (Inches)	22.7 (+7.9)	27.3 (+9.6)	28.7 (-3.8)	26.2 (+5.1)

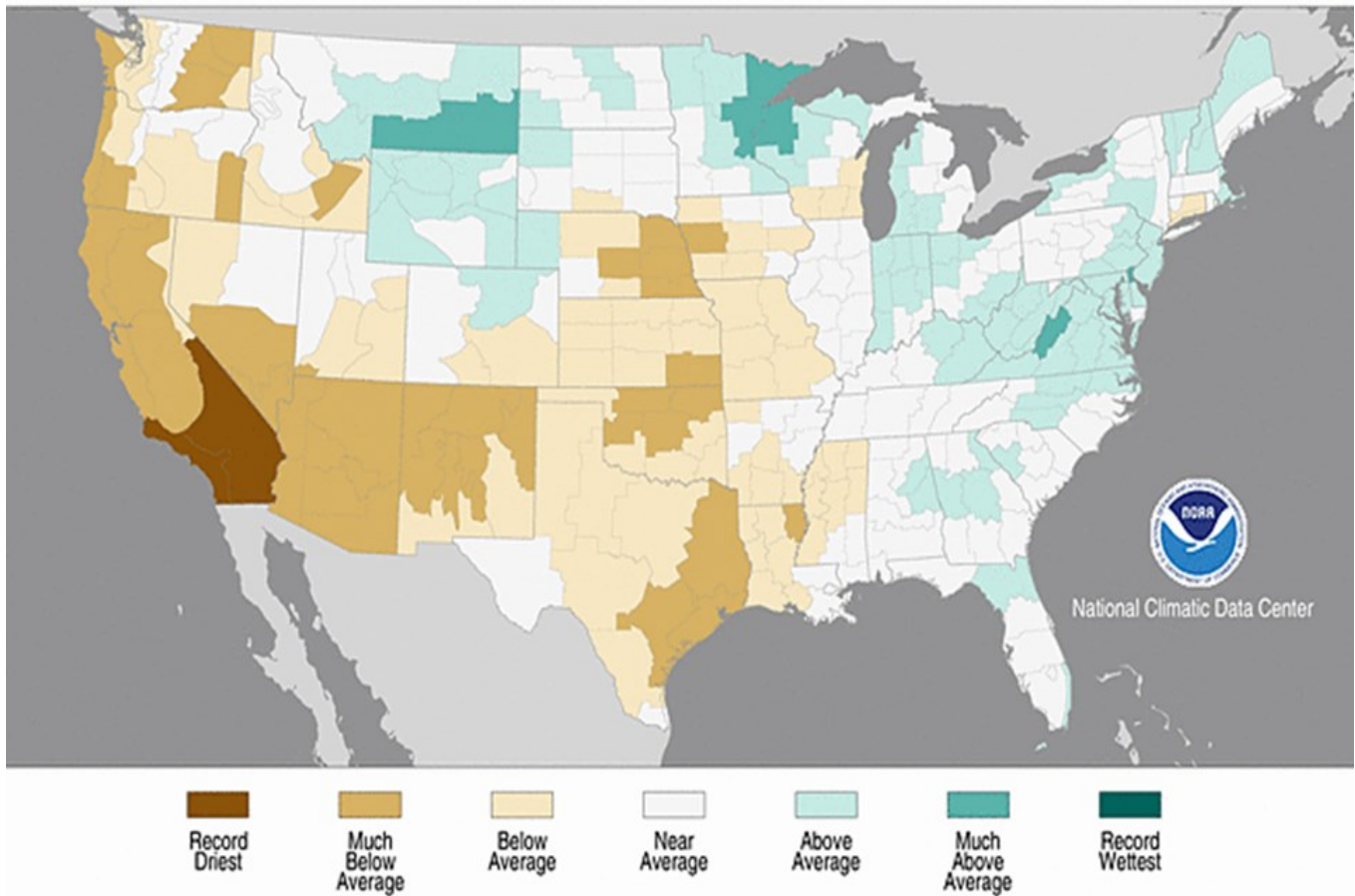
nation were Florida and the Southwest, with record warmth over the Desert Southwest. (See Figure 1)



*Figure 1. United States winter 2013-14 temperature rankings since 1895. A vast portion of Mid-America experienced cooler to much cooler than normal temperatures from December 2013 through February 2014.*

The much colder temperatures also resulted in a drier than normal winter over central and western portions of the nation (Figure 2), although above normal precipitation prevailed over northern and eastern portions of the nation. For the lower 48 states, it was the driest winter since 2002, and 9<sup>th</sup> driest on record. For Kansas, it was the driest winter since 2009, and 18<sup>th</sup> driest on record. Despite the below normal precipitation, snowfall on average was above normal across the region. Colder temperatures in general creates snow that holds less moisture and accumulates more than temperatures closer to freezing, which is the likely culprit for the disparity between above normal snowfall but below normal melted-down precipitation.

## Divisional Precipitation Ranks December 2013–February 2014



*Figure 2: United States winter 2013-14 precipitation rankings since 1895. A vast portion of the central and western U.S. experienced dry to very dry conditions from December 2013 through February 2014.*

What weather will spring and summer hold? Only time will tell.



Be sure to find us by searching for

**NWS Wichita**

on YouTube

## ***Your Role as a Community Based Spotter and the Expected Core Values***

*By: Chance Hayes—Warning Coordination Meteorologist*

“As you are  
out spotting  
for the NWS,  
your county,  
or yourself?...”

Your duty as a volunteer Community Based Spotter is extremely important to us at the NWS. You are basically our eyes in the field as the radar beam at your location may actually be up to 6000 feet above ground level. Of course, the closer you are to the radar, the lower the beam will be to the ground. However, we at the NWS will never know exactly how large a hail stone is, how strong the winds are, or if a tornado is actually on the ground unless you the spotter relays that vital information. Your reports to the NWS are vital in the hierarchy of communications. It is your report that gets peoples attention, aids the warning forecaster, and helps to save lives and property. It is common knowledge that most folks get their weather information directly from our media partners such as the television stations or local radio stations. However, have you ever wondered where they get their hazardous weather reports that they are relaying to you? Yep you guessed it; they get that information primarily from the NWS. Therefore if the NWS are not getting the reports, the broadcasters have limited information to relay to you and your neighbors. Wouldn't you like to have more information when trying to make a decision of whether or not to seek shelter? I would think that answer would be a resounding YES!!

One thing I ask of you as we embark on another storm season here in Kansas is to ask yourself when the last time you actually relayed hazardous weather from your location to help make us and the media aware of the situation.

As you are out spotting for the NWS, your county, or yourself? I hope that you keep the core values (listed below) in mind and fulfill your role as a Community Based Spotter.

- ✦ **Am Aware of the Expected Weather**
- ✦ **Am Trained at Recognizing Significant Weather**
- ✦ **Am Dedicated to Reporting the Significant Weather I Observe**
- ✦ **Will Ensure that Those that I am Associated With, as well as Myself, Will Stay Safe During Significant Weather.**

## ***New Tool for Accessing Past Weather Information***

*By: Andy Kleinsasser - Meteorologist*

In March, the National Weather Service introduced a new tool for accessing past weather information on all of its local office webpages. It can be found at:

<http://www.nws.noaa.gov/climate/xmacis.php?wfo=ict>

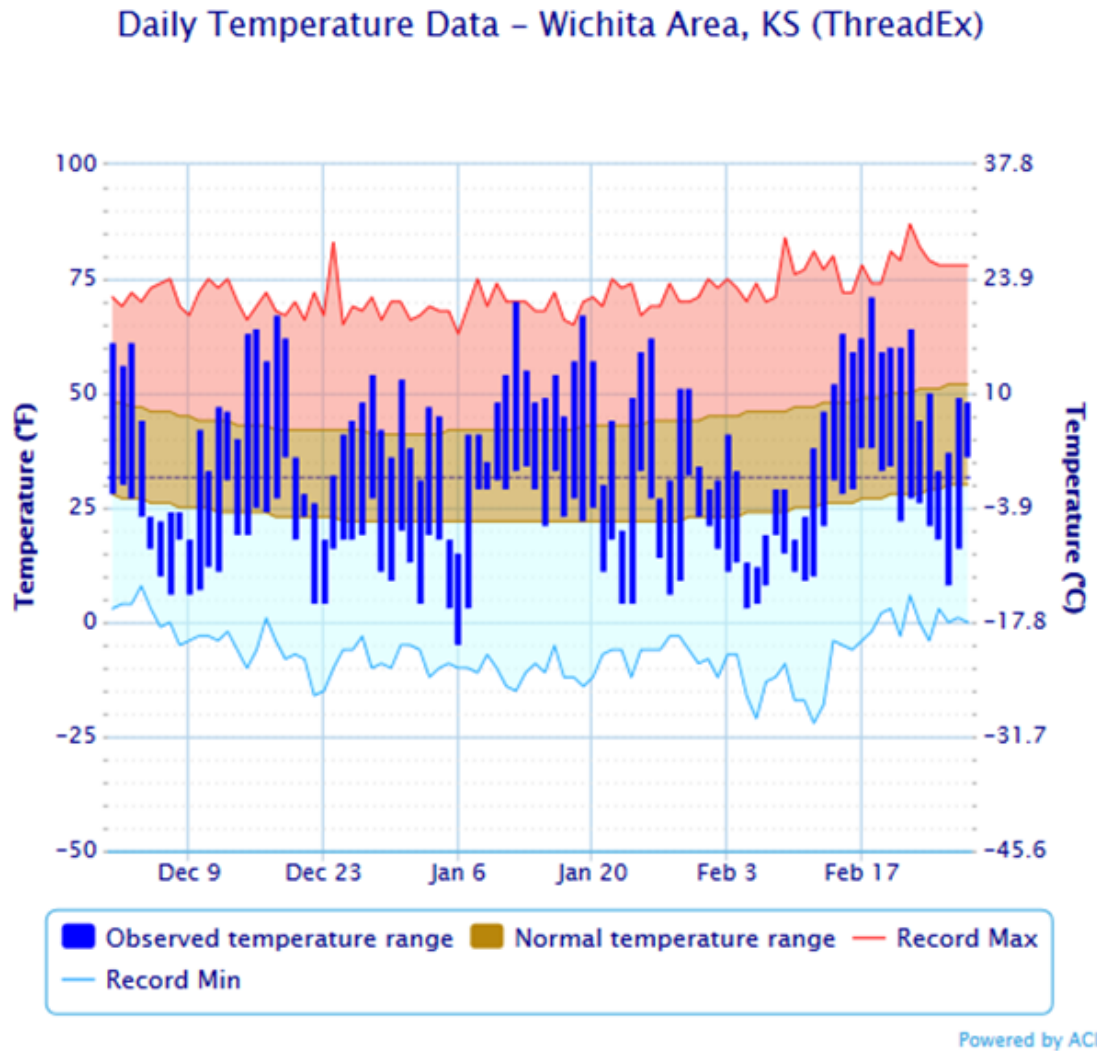
Through this tool, a plethora of past weather information can be accessed for dozens of locations across central, south-central and southeast Kansas. A handful of these elements include observed daily, monthly, seasonal or yearly temperatures and precipitation; interactive temperature and precipitation graphs; average first/last dates (e.g. average first/last frost, average first/last measurable snowfall, etc.), temperature and precipitation extremes, and much more. This tool is a vast improvement over its predecessor in that many more options are available to manipulate the data (including sorting capability); it's more interactive, and weather information is available much further back into the past (e.g. back into the late 1800s for some locations).

The best way to learn is to simply play around with the tool yourself! Please direct any questions/comments to Wichita's webmaster email at [w-ict.webmaster@noaa.gov](mailto:w-ict.webmaster@noaa.gov).

**NOWData - NOAA Online Weather Data**

1. Location »	2. Product »	3. Options »	4. View »
<a href="#">View map</a> Wichita Area Salina Area Anthony 2 W, KS Arkansas City, KS Atlanta, KS Augusta, KS Big Hill Lake, KS Caldwell, KS Cambridge, KS Cassoday, KS	<input type="radio"/> Daily data for a month <input type="radio"/> Daily almanac <input checked="" type="radio"/> Monthly summarized data <input type="radio"/> Calendar day summaries <input type="radio"/> Daily/monthly normals <input type="radio"/> Climatology for a day <input type="radio"/> First/last dates <input type="radio"/> Temperature graphs <input type="radio"/> Accumulation graphs	Year range: 1888 - 2014 Variable: <input type="text" value="Precipitation"/> Summary: <input type="text" value="Sum"/>	<input type="button" value="Go"/>

***Figure 1. This is an example of what the new climate tool interface looks like. See example of output on next page (Figure 2).***



*Figure 2. An example of the temperature graphing tool for Wichita for the period from December through February, 2013-14.*



Be sure to find

**US National Weather Service Wichita Kansas**  
on Twitter at **@NWSWichita**

**Also be sure to check if your county Emergency Manager has a  
Twitter account for the county.**

# A look back at the Winter Season

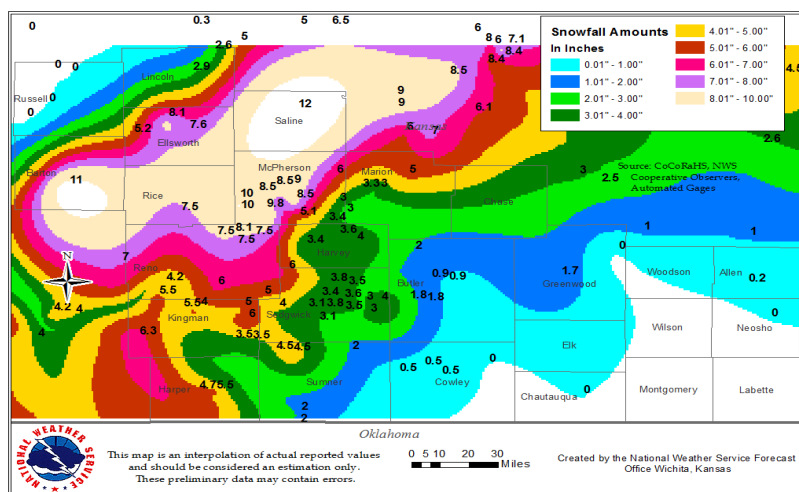
## December 2013-February 2014

*By: Chance Hayes*

When thinking back on this past winter season, what will be the first thing that pops into your mind? Will it be the cold temperatures, heavy snow, ice, or a combination of all three?

Central and southeast Kansas experienced its fair share of each of them. The first event was on the 20th and 21st of December. Much of central Kansas had snowfall amounts of 8 to 14 inches while significant icing occurred in southeast Kansas. What was so interesting about this case is the fact that the snow fall rates in central Kansas were right at 3 inches per hour. These rates are very rare and occurred without thunder.

24 hr Snowfall Totals as of 7am on December 22, 2013



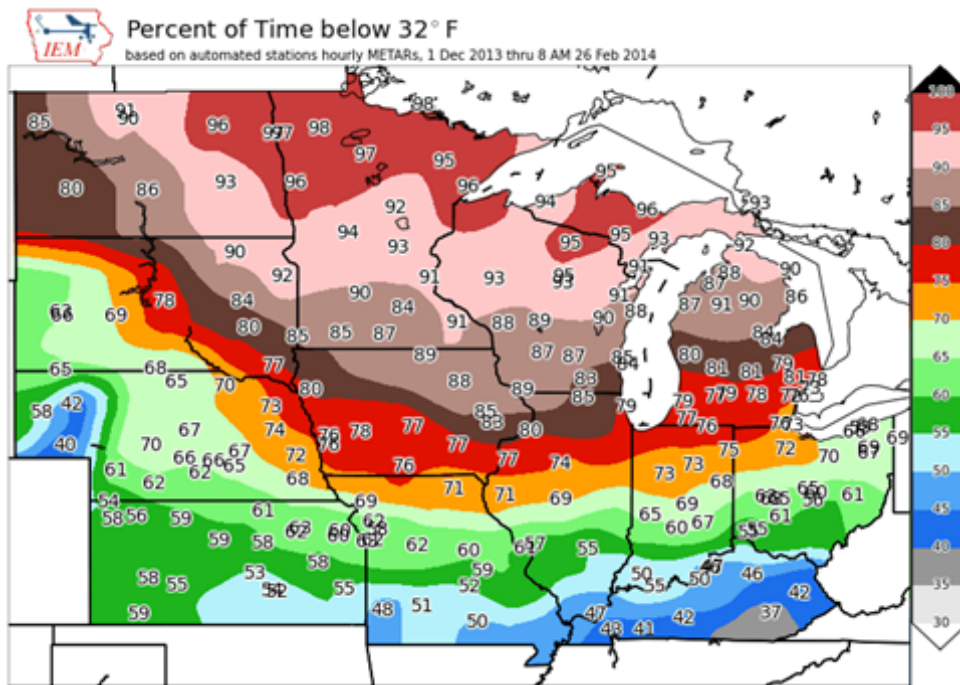
*Left: December 21st, Ice in Neodesha  
Courtesy Lisa Michelle Marie Jamison.*

*Right: December 21st, Snow in Great Bend  
Courtesy Megan McMullen*



*Snow on February 4th, Courtesy  
Keith Jeffers*

The next major winter storm hit in early February on the 4th. This time the snow not only affected the north central sections of the state, but it also spread south towards the state line. In fact, the 8.7 inches of snow that was recorded in Wichita was tied for the 10th highest one day snow total on record. However, the 8.7 inch reading palled in comparison to the 13 inch report near Salina.



Now it is time to examine the cold temperatures of this past winter and how they stacked up to previous years. The winter season which is defined as the 1st of December through the 28th of February was relatively cold compared to the three previous winters due to the fact that those winters were

much warmer than normal. The seasonal average temperature in Wichita for those December through February was 31 degrees. This ranked as the 19th coldest winter dating back to when records began in 1888. The last time Wichita experienced a winter this cold was during the 2009-10 season. For Salina, the average temperature for the same time frame was 28.5 degrees. This ranks as the 10th coldest winter dating back to when records began in 1947. At Chanute the average temperature was 30.3 degrees and was the 9th coldest dating back when records began in 1898. The image above shows the percent of time that temperatures in the Midwest were below 32 degrees through most of the winter season. Kansas' percentages ranged from 52% to 63%.

There are another couple of interesting climate facts for this winter. The first is that 0.3 inches of snow fell in Wichita on the 14th of April. This is significant because it is the second latest snowfall recorded dating back to 1931 when snowfall records began. Secondly, record low temperatures were recorded the morning of April 15th. Russell recorded a low of 18 degrees which shattered the old record of 26 degrees in 1983. In Salina, the temperature dropped to 21 degrees which was 2 degrees cooler than the previous record set in 1936. Lastly, Chanute recorded a low of 23 degrees which was one degree cooler than the record set in 1928.

Needless to say, the past winter season was one that will have a few records of note and will likely be remembered by many for the uncharacteristic snow storms and the return of cold temperatures.

## Prescribed Burns and the Nocturnal Boundary Layer

*By: Jerilyn Billings Wright, Meteorologist*

Every March and April, there are numerous prescribed burns across the Flint Hills. These prescribed burns are done as a land management tool to prevent the encroachment of woody species and to stimulate the natural, native grasslands of the region. These grasslands are utilized as a source of food for livestock. Cattle are the basis of the Flint Hills economy, and fires have long been used as an economical means to improve and maintain the natural and agricultural resources within Kansas. However, what is good for one area of Kansas has proven detrimental to other parts of the state as pollutants in the smoke from these fires have a negative impact on air quality. The amount of smoke and pollutants obviously increases as the amount of prescribed burning on a single day increases, and this abundance of smoke is magnified during the night time hours. Here we will try to explain the process for why this occurs and how you can monitor the possible effects.

The central plains are naturally windy especially in the spring, so finding prime days to execute a prescribed burns is difficult. Generally the conditions needed to burn are wind speeds less than 15 mph, but a minimum amount of wind is also necessary to control the burn. Because days where 15 mph or less of wind are few and far between, a large quantity of prescribed burns are executed on those prime days. When this occurs, smoke is carried downwind from the burn locations. While any location downwind is impacted, it is especially impactful when major metropolitan areas, such as Wichita and Kansas City, are downwind. The Environmental Protection Agency (EPA) has specific air quality restrictions upon the cities, and the increase in smoke and pollutants threatens to exceed these restrictions.

As mentioned before, the impact of the smoke and other pollutants is magnified during the night time hours. This occurs mainly due to the nocturnal boundary layer. The boundary layer is the lowest layer of the atmosphere that we live in. During the daytime hours, the boundary layer is several thousand feet deep. At night the surface temperature cools and inversion forms, the boundary layer becomes decoupled into a much more shallow nocturnal boundary layer and a residual layer. (See Figure 1) A temperature inversion is a point in the atmosphere where the temperature rises with height. Meaning there is a layer of warm air over a layer of cooler air. This warm layer acts as a cap to the lowest levels of the atmosphere. We see this phenomena commonly as strong daytime winds decrease after the sun sets.

The Facebook logo, consisting of the word "facebook" in white lowercase letters on a dark blue rectangular background.

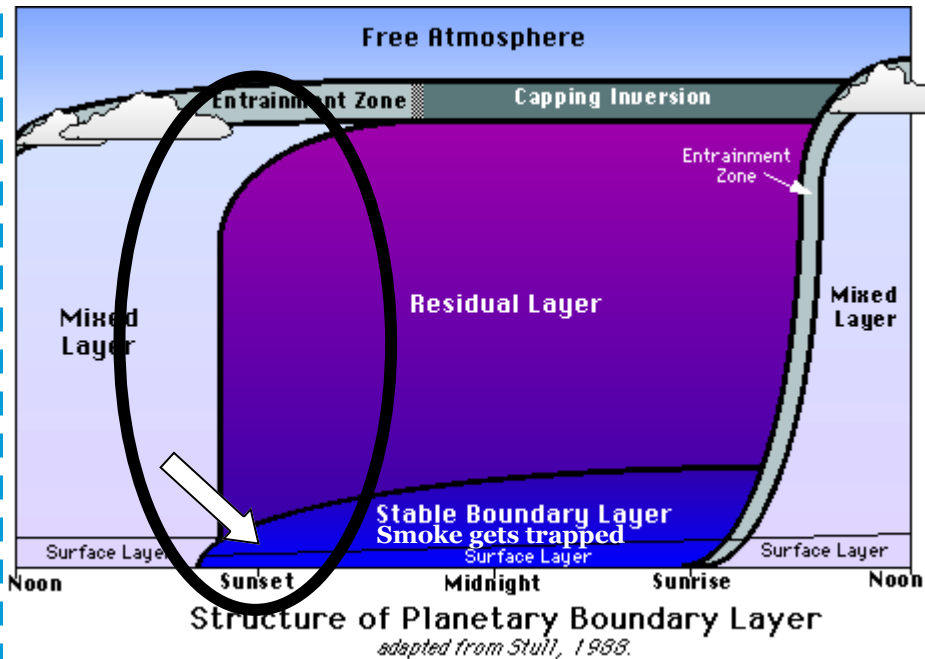
Be sure to find

**US National Weather Service  
Wichita Kansas**

on facebook

**Also be sure to check if your county Emergency Manager has a facebook page.**

So what does this really mean? This means that after the sun sets, the smoke from the daytime burns gets trapped in the nocturnal boundary layer. This causes the concentration of smoke to be higher and more noticeable and impactful to our health.



*Figure 1. This image shows the structure of the Planetary Boundary Layer. The oval and white arrow identifies the beginning of decoupling of the daytime atmosphere into a stable nocturnal boundary layer and a residual layer. When a large amount of burning occurs, smoke gets trapped in this shallow stable boundary layer in higher concentrations.*

To help mitigate these effects there is a law to restrict all burning except rangeland burning through the month of April. More can be read here at <http://www.ksfire.org/>. They also have a smoke management model that will show those burning which counties downwind will be most greatly impacted by the smoke from their burns. <http://ksfire.sonomatechdata.com/view/summary/>



## Wichita, KS - Reporting

@NWSWichita or <http://goo.gl/6gtwUJ>

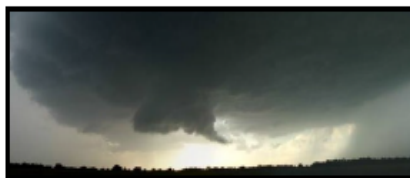
### Report

**T**ime of Event

**E**vent Type

**L**ocation of the storm

**L**ocation of Yourself



[www.weather.gov/wichita](http://www.weather.gov/wichita)

Example: "I saw a tornado at 4:43pm approximately 2 miles south of my location, which is 4 miles NW of Winfield."

### Hail Sizes

0.75"	Penny
1.00"	Quarter
1.25"	Half Dollar
1.75"	Golf Ball
2.50"	Tennis Ball
2.75"	Baseball
4.00"	Grapefruit
4.50"	Softball

### Tornadoes

<b>Damaging Winds</b>
<b>Wall Cloud</b>
<b>Funnel Cloud</b>
<b>Hail</b>
<b>Flooding</b>
<b>Snow Totals</b>
<b>Ice Accumulation</b>

### Wind Reports

> 58 MPH	Twigs & small limbs break off
58-72 MPH	Shingles damaged & large limbs broken
73-112 MPH	Roof damage, windows break, & trees uprooted
113+ MPH	Roofs torn off & trailer homes destroyed



## National Weather Service

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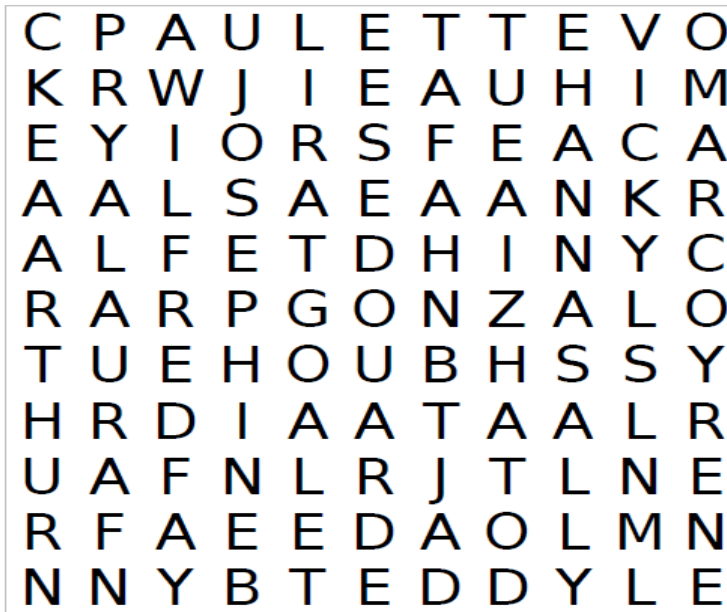
“The National Weather Service (NWS) provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information, database and infrastructure which can be used by other government agencies, the private sector, the public, and the global community.”



**Online: [www.weather.gov/Wichita](http://www.weather.gov/Wichita)**

### 2014 Hurricane Names NWS Wichita

Find the names that will be associated with any 2014 Hurricanes



Arthur  
Edouard  
Isaias  
Marco  
Rene  
Wilfred

Bertha  
Fay  
Josephine  
Nana  
Sally

Cristobal  
Gonzalo  
Kyle  
Omar  
Teddy

Dolly  
Hanna  
Laura  
Paulette  
Vicky

## NWS Wichita Word Search

Answer Below:

